



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/585,202	06/01/2000	John Terry	NC17116	5617
30973	7590	04/21/2004	EXAMINER	
SCHEEF & STONE, L.L.P.			BAYARD, EMMANUEL	
5956 SHERRY LANE			ART UNIT	
SUITE 1400			PAPER NUMBER	
DALLAS, TX 75225			2631	

DATE MAILED: 04/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/585,202

Applicant(s)

TERRY, JOHN

Examiner

Emmanuel Bayard

Art Unit

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 12-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-10 and 16-21 is/are allowed.
- 6) ☒ Claim(s) 1 and 12-14 is/are rejected.
- 7) ☐ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This is in response to RCE filed on 4/2/04 in which claims 1-10 and 12-21 are pending.

#### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmermann et al U.S. Patent No 6,522,700 B1 in view of Kumar U.S. Patent No 6,246,698 B1 and in further view of Ten Brink U.S. Patent No 6,611,513 B1

As per claims 1 and 17, Zimmermann et al discloses in a communication system having a first communication station and at least a second communication station, the first communication station at least operable to transmit data to the second communication station, an improvement of apparatus for the first communication for coding the data prior to transmission thereof at the first communication station, said apparatus comprising: a first modulator coupled to receive indications of the data to be communicated by the first communication station, said first modulator for modulating the indications of the data to form a first modulated signal representative thereof (see fig. 1 element 20 and col. 4, lines 6-7, 35, 55-58); a mapper (see fig. 1 element 40 and col. 4, lines 34, 52-58 and col. 5, lines 1-2) coupled to the first modulator, said mapper for mapping at least a portion of the first modulated signal formed by said first

Art Unit: 2631

modulator to a selected dimension value selected from amongst a plurality of available dimension values.

However, Zimmermann et al does not teach a second modulator coupled to said mapper, said second modulator containing a set of substantially orthogonal bases, the substantially orthogonal bases of the set corresponding in dimension to the selected dimension values into which said mapper maps the at least the portion of the first modulated signal, said second modulator for forming a second modulated signal, the second modulated signal of a dimension responsive to the selected dimension value into which said mapper maps the portion of the first modulated signal and the second modulated signal forming biorthogonal codes defined by the substantially orthogonal bases that define multiple dimensional modulation data for transmission to the second communication station.

Kumar teaches a second modulator coupled to said mapper, said second modulator containing a set of substantially orthogonal bases, the substantially orthogonal bases of the set corresponding in dimension to the available dimension values of the plurality from amongst which said mapper selects the selected dimension value into which the first antipodal signal formed of the first modulated signal to be mapped, said second modulator for forming a second modulated signal, the second modulated signal of a dimension responsive to the selected dimension value into which said mapper maps the portion of the first modulated signal and the second modulated signal forming biorthogonal codes defined by the substantially orthogonal bases that define multiple dimensional modulation data for transmission to the second communication station. (See fig.5 element 83 and col.42, lines 19-67 and col.48, lines 50-67 and col.51, lines 24-67).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Kumar into Zimmermann as to determine whether the transmitted signal corresponds to one of the points defined as 4-Ary PSK constellation #1 or one of the points defined as 4-Ary constellation #2 as taught by Kumar (see col.51, lines 45-67).

However Zimmermann and Kumar in combination do not teaches the first modulated signal forming antipodal signal.

Ten Brink teaches the first modulated signal forming antipodal signal (see col.2, lines 49-53 and col.2, line 67 to col.3, lines 1-5).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Ten Brink into Kumar and Zimmermann as to add up N binary antipodal code at the multicode transmitter to form N+ 1 level amplitude modulated signal as taught by Ten Brink (see col.2, lines 49-53)

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmermann U.S. Patent No 6,522,700 B1 as applied to claim 1 above in view of Kumar U.S. Patent No 6,246,698 B1 and Ten Brink U.S. 6,611,513 B1, and further in view of Chapman U.S. Patent No 6,272,108 B1.

Zimmermann et al and Kumar and Ten Brink teach in combination all the features of the claimed invention except a rotator coupled between the mapper and the second modulator.

Chapman teaches rotator (fig.3 element 57) coupled between the mapper (see fig.3 element 54 and the second modulator (see fig.3 element 78).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Chapmann into Zimmermann, Kumar and Ten Brink as to perform vector multiplication on the rotation vector and the mapped N-2s msb to cause a phase rotation, thus producing the final quadrant symmetric circular signal space constellation as taught by Chapman (see col.7, lines 43-46).

Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmermann U.S. Patent No 6,522,700 B1 as applied to claim 1 above in view of Kumar U.S. Patent No 6,246,698 B1 , and Ten Brink U.S. 6,611,513 B1 and in further view of Ling et al U.S. Patent No 6,377,607 B1.

Zimmermann et al, Kumar and Ten Brink teach in combination all the features of the claimed invention except an energy detector coupled to receive indications of the data transmitted by the first communication station and received at the second communication station, said energy detector for detecting energy levels of the indications, thereby to determine values representative of the data.

Ling et al teaches a C/I estimation circuit (see figs.5, 6, 9 elements 92, 120, 210 and col.10, lines 40-65 and col.11, lines 34-55 and col.16, lines 34-67) corresponds to the claimed (energy detector) coupled to receive indications of the data transmitted by the first communication station and received at the second communication station, said estimation circuit (energy detector) for detecting power corresponds to the claimed (energy levels) of the indications, thereby to determine values representative of the data.

It would have been obvious to one of ordinary skill in the art to implement the teaching of Ling et al into Zimmermann, Kumar and Ten Brink as to compute the total received energy

per chip which includes both a desired signal and an interference signal component as taught by Ling et al (see col.12, lines 38-40).

As per claim 14, Ling et al teaches a normalizer (see fig.9 element 212 and col.16, lines 42-67 and col.17, lines 1-30) coupled to receive the indications of the data receive at the second communication, said normalizer for normalizing the indications of the data and for generating a normalized representation thereof; a square-law device (see fig.9 element 214, 215 and col.16, lines 43-67) coupled to the receive the normalized representations by said normalizer, said square-law device for forming a squared representation of the normalized representation of the indications of the data.

It would have been obvious to one of ordinary skill in the art to implement the teaching of Ling et al into Zimmermann, Kumar and Ten Brink as compute the average of the square of the complex normalized data samples representing an estimate of the energy of the data samples as taught by Ling (see col.16, lines 58-65).

#### *Allowable Subject Matter*

Claims 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 2-10 and 16-21 are allowed over the prior art of record.

The following is a statement of reasons for the indication of allowable subject matter: a derotator for derotating the indications of the data received at the second communication station as recited in claims 15 and 21.

*Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is 703 308-9573. The examiner can normally be reached on Monday-Friday (7:Am-4:30PM) Alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 703 306-3034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Emmanuel Bayard  
Primary Examiner  
Art Unit 2631

4/16/04

